Clean Copy of Claim 10

--10. A method of detecting mutations in BRCA1 genes comprising providing PCR primers capable of amplifying the entire coding sequence of the BRCA1 genes; amplifying a test sample containing nucleotide sequences by long distance multiplex PCR with exon fragments numbered 10-11, 12-13, 14-17, 18-20, and 21-24, using primer sequences SEQ ID Nos. 37 and 38, 39 and 40, 41 and 42, 43 and 44, and 45 and 46, respectively, producing a first set of amplification products; subjecting this first set of amplification products to short distance multiplex PCR to produce a second set of amplification products with exon fragments numbered 11.1 F and R through 11.16 F and R, using primer sequence pairs SEQ ID Nos. 47 and 48 through 77 and 78, respectively, and exon fragments numbered 2 F and R through 10 F and R, and 12 F and R through 24 F and R, using primer sequence pairs SEQ ID Nos. 79 and 80 through 119 and 120, respectively, and with clamping and linking sequences therefor for effecting said short distance multiplex PCR; and subjecting the second set of amplification products to two-dimensional gel electrophoresis to produce a characteristic spot pattern for a specific mutation in the BRCA1 gene.—